

interpolating between pairs of the four arcs mentioned above and providing smoothing between two partial surfaces at each of the four initial arcs.

A third embodiment of the invention comes closest to preserving the initial shape of the cornea. Initially, a large number of angularly spaced meridians, for example 72, are generated on the surface model. The curves defining the meridians, which extend from the HIGH point to the periphery of the working region of the cornea are each estimated by a circular arc. Each of these arcs is then corrected in curvature to achieve the required diopter correction at the respective arc. The post-operative corneal surface is then estimated by generating a best-fit surface corresponding to all of the corrected arcs.

Brief Description of the Drawings

The foregoing brief description, as well as other objects, features and advantages of the present invention will be understood more completely from the following detailed description of presently preferred embodiments, with reference being had to the accompanying drawings in which:

Figure 1 is a block diagram illustrating a method for achieving laser ablation of the cornea in accordance with the present invention;

Figure 2 is a schematic diagram illustrating a plan view of a point cloud as obtained with a corneal image capture system;

Figure 3 is a schematic plan view similar to Fig. 2 illustrating a plurality of splines and how they are connected through the data points of the point cloud;

Figure 4 is a perspective view of a cornea matching surface illustrating how characterizing curves are constructed;

Figure 5 is a plan view in the tilted plane illustrating how the cornea matching surface is modified to provide vision correction in accordance with a first embodiment;

Figure 6 is a plan view in the tilted plane illustrating how the cornea matching surface is modified in